SPECIFICATION AMENDMENTS

On page 1, insert above line 1, insert--Priority Claim

The present application claims priority on European Patent Application 03104972.9 filed 24 December 2003.--

On page 1, delete title on line 1.

On page 1, above line 2, insert--Field of the Invention--

On page 1, above line 5, insert--Background of the Invention--

On page 2, insert after line 26--Summary of the Invention--

On page 2, delete line 27-33.

On page 3, delete line 1-7.

Paragraph on line 8 of page 3 has been amended as follows:

--The present inventions include a ~~The~~ The method according to the invention for determining a fluid inflow profile along the length of a permeable inflow region of an underground wellbore comprises the steps of:

- transferring heat into or from the permeable inflow region of the wellbore during a well shut in period such that at least a substantial part of the inflow region has a temperature which is different from the temperature of the surrounding formation;

-starting production of hydrocarbon fluids via said permeable inflow region;

-measuring substantially simultaneously the temperature of the fluids at various points along at least part of the length of the inflow region;

-determining at selected intervals of time after production start up a temperature profile along at least part of the length of the inflow region on the basis of the thus measured temperatures ; and

-determining a fluid inflow profile along the length of said inflow region on the basis of a comparison of the determined temperature profiles at selected intervals after

production start up , wherein at least a substantial part of the permeable inflow region is heated during the well shut-in period and wherein during an initial period of time after starting production of hydrocarbons via said permeable inflow region heating of the permeable inflow region is continued and wherein during a subsequent period of time following said initial period heating of the permeable inflow region is interrupted, and the temperature is measured both during said initial and subsequent periods of time and wherein differences between the temperature variation over time measured during said initial and subsequent period are used to determine a heat capacity of the inflowing fluid.—

On page 4, after line 8, please insert the following paragraph:

--The present inventions also include

On page 5, delete line 5-13.

On page 5, delete line 25-30

On page 8, line 1, amend as follows: Detailed Description ~~of the Invention~~ --

Paragraph on line 4 of page 2 has been amended as follows:

On page 9, after line 6, insert the following paragraphs:

-- The level of temperature variation per unit of time, such as the local heat up or cool down rate, may used as an indicator of the level of influx of fluid at various points along the length of said inflow region.

In case during a shut in, when no fluids flow into the well, a well inflow region is heated by an electrical heater cable which has a substantially constant electrical resistance along the length of the heated section this will result in an substantially constant increase in well temperature over time along the heated section. When the well is put back on production the zones with relatively high flow rates will cool down to reservoir temperature faster than zones with no or little fluid flow.

Accordingly, the inflow profile may be determined such that if at a specific location the measured temperature variation over time is higher than at adjacent locations

along the length of the permeable inflow region the thus measured peak in the temperature variation per unit of time is used as an indicator that at said specific location the influx of fluids is higher than at said adjacent locations, whereas if at another specific location the measured temperature variation per unit of time is lower than at adjacent locations along the length of the permeable inflow region the thus measured dip in the temperature variation per unit of time is used as an indicator that at said other specific location the influx of fluids is lower than at said adjacent locations.

In the method according to the invention a ratio of the temperature variation over time measured during the initial period and during the subsequent period is determined for various points along the length of the inflow region and said ratio is used as an indicator of the heat capacity of the fluid flowing into the well. More particularly, a relatively high ratio between the temperature variation measured during the initial and subsequent periods may be used as an indicator that the inflowing fluid has a relatively low heat capacity and a relatively high gas content.

The permeable inflow region may be heated by an electrical heater cable extending along at least a substantial part of the length of the permeable inflow region and the temperature may be measured by means of a fiber optical distributed temperature sensor (DTS) extending along at least a substantial part of the length of the permeable inflow region.

The fiber optical distributed temperature sensor (DTS) may be strapped to the outer surface of the electrical heater cable.

Alternatively, the electrical heater cable may comprise an electrical conductor, which is surrounded by a mineral insulation layer comprising a compacted mineral powder, which is enclosed in an annular metal sheath, and the fiber optical sensor is embedded in a channel extending through the mineral insulation layer.--

On page 19, after line 10, insert the following paragraphs:

--Some embodiments of the inventions also relate to a method of producing crude oil from a subterranean formation, wherein the influx of crude oil and/or other fluids into the well is determined and/or adjusted to an optimal level on the basis of the method according to the invention.

Some embodiments of the inventions furthermore relate to heater and distributed temperature sensing (DTS)system suitable for use in the method according to the

invention. The system comprises one or more mineral insulated heater cables, which each comprise an electrical conductor which is surrounded by a mineral insulation layer comprising an compacted mineral powder, which layer is enclosed in an annular metal sheath, and a fiber optical distributed temperature sensor which extends along at least a substantial part of the length of one or more mineral insulated heater cables.

Optionally at least one fiber optical distributed temperature (DTS) sensor extends through a channel extending through the mineral insulation layer of at least one of the mineral insulated heater cables.--

Paragraph on line 9 of page 11 has been amended as follows:

-- The heater assembly is configured such that the voltage between the central metal rod 15 and sheath 14 is substantially below the breakdown voltage of the insulant 16 at the expected operating temperature of the heater. The sheath alloy has to have a low enough corrosion rate such that a substantially low fraction of its thickness is negatively affected by corrosion over the lifetime required of the heater. The mechanical strength of the heater assembly ~~has to be~~ is sufficient to avoid elongation damage to the MI heater cables 13 when suspended vertically in the well. For most of the applications in DTS measurements these conditions should be satisfied.--

Paragraph on line 32 of page 11, ending on line 4 of page 12, has been amended as follows:

--The sheath 14 as well as the cold pins and the splices described below ~~have to~~ are devoid of holes that might allow moisture into the insulant 16. Excessive moisture in the insulant 16 can lead to a drop in insulant resistivity and/or a chemical change leading again to a drop in resistivity.--

Paragraph on line 18 of page 13, ending on line 9 of page 14, has been amended as follows:

-- The heated section of the heater is normally connected to a lead-in cable 19 that penetrates the overburden. The MI heater cable 13 operates at the maximum temperature required for the DTS measurements while the lead-in cable 19 is normally rubber insulated and cannot exceed about 65 Degrees Celsius (150 °F) (although more expensive lead-in options can be used either rubber insulated or made from MI cable also). An economic solution is to place a short transition section 13A of MI cable 13 between the heated section and the lead-in cable. This transition section 13A of MI cable 13 is made

from a less resistive core than the heated section in order to decrease the power dissipation along its length and therefore lower its temperature. Alloys of the type listed above can be used with varying diameters and the cold pin lengths can vary from 1.5 to 15 m. A preferred mode is a 10 m cold pin filled with the same insulant 16 as the heated section. A suitable sheath for the cold pin is Inconel 600. To inhibit chloride corrosion cracking in the cold-pin region the sheath 16 of the transition section may comprise Inconel 600 for corrosion protection of this type. In addition to cold-pins at the top one might elect to also place cold-pins at the end of the heated section. This can make the bottom termination easier to manufacture but adds cost.--

On page 15, delete line 16-18.

On page 20, above line 1, insert --We claim:--